

PATENT ABSTRACTS OF JAPAN

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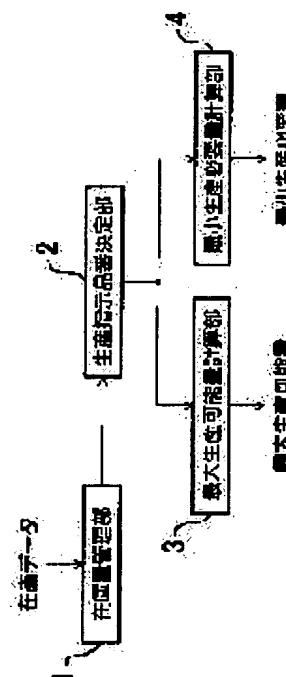
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(54) DEVICE FOR PRODUCTION PLAN VOLUME PREPARATION AND METHOD THEREOF

(57)Abstract:

PROBLEM TO BE SOLVED: To prepare a production plan volume wherein a product number is selected only for an article to be produced in the production planning stage and whereby a limitation can be avoided for a changeover of production.

SOLUTION: This device comprises an inventory volume management part 1, a production instruction product number determination part 2, a possible maximum production volume calculation part 3, and a required minimum production volume calculation part 4. The inventory volume management part 1 manages volume of a physical inventory, an ordering point, and a restocking point. The production instruction product number determination part 2 determines a product number as a production instruction product number when the physical inventory volume is lower than the ordering point volume based on the volume of the physical inventory and the ordering point. The possible maximum production volume calculation part 3 calculates a difference between the restocking point volume and the physical inventory volume as a possible maximum production volume for the determined production instruction product number. The required minimum production volume calculation part 4 calculates an estimated shipment volume to be shipped by a next production planning day for the determined production instruction product number based on an average shipment volume a day and a number at days until the next production planning day, and an estimated inventory volume at the next production planning day from the estimated shipment volume and the physical inventory volume to calculate a difference between the estimated inventory volume and the ordering point volume as a required minimum production volume.



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CLAIMS

[Claim(s)]

[Claim 1]The amount preparation device of planning of production which is provided with the following and characterized by creating the optimal amount of planning of production between said maximum producible quantity and said minimum production initial complement about each of a lot number determined by said production instruction lot number deciding part.

An inventory management department which manages the amount of physical inventory which is a actual inventory for every lot number, order point quantity which is the amount of basic stock of the lot number, and replenishment point quantity which is the amount of replenishment of stock.

A production instruction lot number deciding part which determines a lot number in which the amount of physical inventory is less than order point quantity as a production instruction lot number based on the amount of physical inventory and order point quantity which are managed by this inventory management department.

A maximum producible quantity calculation part which calculates difference of replenishment point quantity and the amount of physical inventory which are managed by said inventory management department as a maximum producible quantity about each of a lot number determined by this production instruction lot number deciding part.

About each of a lot number determined by said production instruction lot number deciding part. Based on an average shipment per day, and days by the next planning-of-production day, the amount of shipment prediction by the next planning-of-production day is calculated, The minimum production initial-complement calculation part which calculates the amount of stock forecasts in the next planning-of-production day, and calculates difference of this amount of stock forecasts, and order point quantity managed by said inventory management department as a minimum production initial complement from this amount of shipment prediction, and the amount of physical inventory.

[Claim 2]The amount preparation method of planning of production comprising:

A procedure in which the amount of physical inventory determines a lot number which is less than order point quantity as a production instruction lot number based on the amount of physical inventory and order point quantity which are managed by inventory management file.

A procedure which calculates difference of replenishment point quantity and the amount of physical inventory which are managed by inventory management file as a maximum producible quantity about each of a determined lot number.

A procedure which calculates the amount of shipment prediction by the next planning-of-production day based on an average shipment per day, and days by the next planning-of-production day.

A procedure which calculates the amount of stock forecasts in the next planning-of-production day from this calculated amount of shipment prediction, and the amount of physical inventory managed by inventory management file, A procedure which calculates difference of this calculated amount of stock forecasts, and order point quantity managed by inventory management file as a minimum production initial complement, and a procedure which creates the optimal amount of planning of production between said maximum producible quantity and said minimum production initial complement about each of a determined lot number.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the amount preparation device of planning of production and the amount preparation method of planning of production which determine the amount of planning of production of the stock-production article which needs inventory management, such as order point management, and more in details. It is related with the amount preparation device of planning of production and the amount preparation method of planning of production which create the amount of planning of production (the amount of production instruction) so that restrictions of plan substitutes (metallic mold exchange, color substitution of resin, etc.) of production can be avoided.

[0002]

[Description of the Prior Art]Before, the amount preparation device of planning of production by an order point managing system is proposed variously.

[0003]For example, the amount preparation device of planning of production given in JP,7-24703,A, The production type selection part which selects the selection variety in which the variety which should be produced from the relation between an inventory and order quantity is shown, and computes the amount of production lots about each of selection variety, About each of selection variety, from the amount of production lots computed by the production type selection part, and the tact time for every variety given beforehand. The necessary time calculating part which computes the production requirement time which production of the amount of production lots takes about each of selection variety, The variety classification part which classifies the selection variety in which production requirement time is longer than the impossible time zone which shows the time zone which cannot perform a plan substitute from other selection variety, It has composition provided with the operation-sheet preparing part which creates the operation sheet which assigned production of the selection variety classified noting that production requirement time was longer than the impossible time zone in this variety classification part to the impossible time zone.

[0004]That is, by the production requirement time of the amount of production lots using variety longer than an impossible time zone as selection variety, and assigning production of this selection variety to an impossible time zone, within an impossible time zone, production is continued till time for a plan substitute to become possible so that production may not be completed that is,.

[0005]In such a conventional amount preparation device of planning of production, when determining the amount of planning of production of the product which performs order point management (a lot number, quantity), about quantity, the amount of planning of production is calculated from replenishment point quantity and the amount of physical inventory. The amount of physical inventory is pointing as candidate watch of planning of production as a measure for avoiding restrictions of a plan substitute of production also about the lot number which is not less than order point quantity. That is, he was trying to avoid restrictions of a plan substitute by increasing the lot number which may be produced.

[0006]

[Problem(s) to be Solved by the Invention]In the preparation method of the amount of planning of production by the above-mentioned conventional amount preparation device of planning of

production. There is only one kind of amount of planning of production to one variety (lot number), the lot number which does not need to be essentially produced for evasion of a plan substitute of production was also put into the candidate of planning of production, and the order of production is decided that restrictions are avoidable from the inside. Therefore, the lot number which does not need to be produced will be produced and the fault that useless stock will increase in number or the production sequence of the lot number (lot number which has raised the order point piece with few amounts of physical inventory than order point quantity) which should be produced will be turned back had occurred.

[0007]It is in providing the amount preparation device of planning of production which can be created and the amount preparation method of planning of production of the amount of planning of production which chooses only the lot number which was originated that this invention should solve the starting problem and should produce the purpose at the time of planning of planning of production, and can avoid restrictions of a plan substitute of production.

[0008]

[Means for Solving the Problem]In order to solve an aforementioned problem, the amount preparation device of planning of production of this invention according to claim 1, An inventory management department which manages the amount of physical inventory which is a actual inventory for every lot number, order point quantity which is the amount of basic stock of the lot number, and replenishment point quantity which is the amount of replenishment of stock, A production instruction lot number deciding part which determines a lot number in which the amount of physical inventory is less than order point quantity as a production instruction lot number based on the amount of physical inventory and order point quantity which are managed by this inventory management department, A maximum producible quantity calculation part which calculates difference of replenishment point quantity and the amount of physical inventory which are managed by said inventory management department as a maximum producible quantity about each of a lot number determined by this production instruction lot number deciding part, About each of a lot number determined by said production instruction lot number deciding part. Based on an average shipment per day, and days by the next planning-of-production day, Calculate the amount of shipment prediction by the next planning-of-production day, and from this amount of shipment prediction, and the amount of physical inventory. About each of a lot number which was provided with the minimum production initial-complement calculation part which calculates the amount of stock forecasts in the next planning-of-production day, and calculates difference of this amount of stock forecasts, and order point quantity managed by said inventory management department as a minimum production initial complement, and was determined by said production instruction lot number deciding part. The optimal amount of planning of production is created between said maximum producible quantity and said minimum production initial complement.

[0009]The amount preparation method of planning of production of this invention according to claim 2 comprises:

A procedure in which the amount of physical inventory determines a lot number which is less than order point quantity as a production instruction lot number based on the amount of physical inventory and order point quantity which are managed by inventory management file.

A procedure which calculates difference of replenishment point quantity and the amount of physical inventory which are managed by inventory management file as a maximum producible quantity about each of a determined lot number.

A procedure which calculates the amount of shipment prediction by the next planning-of-production day based on an average shipment per day, and days by the next planning-of-production day.

A procedure which calculates the amount of stock forecasts in the next planning-of-production day from this calculated amount of shipment prediction, and the amount of physical inventory managed by inventory management file, A procedure which calculates difference of this calculated amount of stock forecasts, and order point quantity managed by inventory management file as a minimum production initial complement, and a procedure which creates the optimal amount of planning of production between a maximum producible quantity and the

minimum production initial complement about each of a determined lot number.

[0010]

[Embodiment of the Invention] Hereafter, an embodiment of the invention is described with reference to drawings.

[0011] Drawing 1 is a block diagram showing the system configuration of the amount preparation device of planning of production which performs the amount preparation method of planning of production of this invention.

[0012] General classification of this amount preparation device of planning of production constitutes it from the inventory management department 1, the production instruction lot number deciding part 2, the maximum producible quantity calculation part 3, and the minimum production initial-complement calculation part 4.

[0013] Based on the stock data obtained from the computer for inventory management which is not illustrated, the inventory management department 1, It is the block which manages the amount of physical inventory which is a actual inventory for every lot number, the order point quantity which is the amount of basic stock of the lot number, and the replenishment point quantity which is the amount of replenishment of stock, and is managed by the file format as shown in drawing 3.

[0014] The production instruction lot number deciding part 2 is a block with which the amount of physical inventory determines the lot number which is less than order point quantity as a production instruction lot number based on the amount of physical inventory and order point quantity which are managed by the inventory management department 1.

[0015] The maximum producible quantity calculation part 3 is a block which calculates the difference of the replenishment point quantity and the amount of physical inventory which are managed by the inventory management department 1 as a maximum producible quantity about each of the lot number determined by the production instruction lot number deciding part 2.

[0016] The minimum production initial-complement calculation part 4 about each of the lot number determined by the production instruction lot number deciding part 2. Based on the average shipment per day, and the days by the next planning-of-production day, the amount of shipment prediction by the next planning-of-production day is calculated, It is the block which calculates the amount of stock forecasts in the next planning-of-production day, and calculates the difference of this amount of stock forecasts, and the order point quantity managed by the inventory management department 1 as a minimum production initial complement from this amount of shipment prediction, and the amount of physical inventory. The data of the average shipment per day is data called for from the shipment track record and order track record of the past managed by the host computer which is not illustrated.

[0017] That is, the amount preparation device of planning of production of this invention will create the optimal amount of planning of production between a maximum producible quantity calculated by the maximum producible quantity calculation part 3, and the minimum production initial complement calculated by the minimum production initial-complement calculation part 4 about each of the lot number determined by the production instruction lot number deciding part 2.

[0018] Here, with reference to the imaged figure shown in drawing 2, the relation is explained about the amount of physical inventory, order point quantity, replenishment point quantity, a maximum producible quantity, and the minimum production initial complement.

[0019] The order point quantity and replenishment point quantity in a figure are conventionally used in a well-known order point managing system, and are set up for every lot number based on a past shipment track record and order track record. The solid line in a figure is the inventory transition by the planning-of-production day D1, and the value which subtracted the amount of physical inventory of the planning-of-production day D1 from replenishment point quantity serves as a maximum producible quantity in the time. The dashed line in a figure is shipment prediction transition after the planning-of-production day D1, and this is the value predicted based on a past shipment track record, an order track record, etc. and -- being based on this shipment prediction transition -- the next ***** -- the value which subtracted the amount of

stock forecasts in Japanese D2 from order point quantity serves as the minimum production initial complement.

[0020]Next, creation processing of the amount of planning of production in the amount preparation device of planning of production of the above-mentioned composition is explained concretely.

[0021]The amount of physical inventory of each lot number managed in the inventory management department 1, order point quantity, and replenishment point quantity presuppose that it is shown, for example in drawing 3. That is, about the lot number AA, it is amount of physical inventory:80, order-point-quantity:100, and replenishment-point-quantity:200. Here, AA, BB, CC, DD, and five kinds of lot numbers of EE are illustrated.

[0022]In the production instruction lot number deciding part 2, the amount of physical inventory determines the lot number which is less than order point quantity as a production instruction lot number based on the amount of physical inventory, and order point quantity about each of five kinds of lot number AA-EE managed by the inventory management department 1. In this example, since the amount of physical inventory is less than order point quantity about three kinds of the lot numbers AA, BB, and CC, three kinds of these lot numbers AA, BB, and CC are determined as a production instruction lot number.

[0023]In the maximum producible quantity calculation part 3, about each of three kinds of lot numbers AA, BB, and CC determined by the production instruction lot number deciding part 2, the difference of the replenishment point quantity and the amount of physical inventory which are managed by the inventory management department 1 is calculated, and let the value be a maximum producible quantity (refer to lower type (1)).

[0024]

the maximum production is possible -- the amount of quantity = replenishment-point-quantity-physical inventory --- (1)

That is, it is set [lot number / AA / BB / $200-80=120$ and / lot number] to $600-260=340$ about $400-150=250$ and lot number CC. This example of a calculation result is shown in drawing 4 in list form.

[0025]In the minimum production initial-complement calculation part 4, the amount of shipment prediction by the next planning-of-production day (the amount of planning-of-production period shipment prediction) is first calculated based on the average shipment per day, and the days by the next planning-of-production day about each of three kinds of lot numbers AA, BB, and CC determined by the production instruction lot number deciding part 2. Here, the average shipment per day (daily mean shipment) is calculated from the past shipment track record etc. Drawing 5 has illustrated the daily mean shipment of each lot numbers AA, BB, and CC for which it asked from the past shipment track record etc. In this example, if planning of production shall be drawn up once per week, a planning-of-production period (periods from D1 to D2 of drawing 2) will be seven days. Therefore, the amount of planning-of-production period shipment prediction of each lot numbers AA, BB, and CC is calculated by the lower type (2).

[0026]

The amount of planning-of-production period shipment prediction = daily mean shipment x planning-of-production period --- (2)

That is, it is set [lot number / AA / BB / $10 \times 7=70$ and / lot number] to $30 \times 7=210$ about $20 \times 7=140$ and lot number CC. This example of a calculation result is shown in drawing 6 in list form.

[0027]Next, the amount of stock forecasts in the next planning-of-production day is calculated by a lower type (3) from this amount of planning-of-production period shipment prediction, and the amount of physical inventory.

[0028]

The amount of stock forecasts = the amount of amount of physical inventory-planning-of-production period shipment prediction ... (3)

That is, it is set [lot number / AA / BB / $80-70=10$ and / lot number] to $260-210=50$ about $150-140=10$ and lot number CC.

[0029]And the amount of stock forecasts of each lot numbers AA, BB, and CC calculated by this

(3) formula calculates the minimum production initial complement by a lower type (4) so that order point quantity may not be cut.

[0030]

The minimum production initial complement = the amount of order-point-quantity-stock forecasts ... (4)

That is, it is set [lot number / AA / BB / $100-10=90$ and / lot number] to $300-50=250$ about $200-10=190$ and lot number CC. This example of a calculation result is shown in drawing 7 in list form.

[0031]The minimum production initial complement about each lot numbers AA, BB, and CC and a maximum producible quantity are calculated by the above computation as shown in drawing 8. For example about the lot number AA, between the minimum production initial complement (90) – a maximum producible quantity (120), since the amount of planning of production can be determined arbitrarily, from this result, it can respond also to restrictions of a plan substitute of production flexibly. Even if it determines the amount of planning of production arbitrarily, since more than the minimum production initial complement will be produced, an order point piece is not raised in the timing of next planning of production.

[0032]

[Effect of the Invention]The amount preparation device of planning of production and the amount preparation method of planning of production of this invention, Based on the amount of physical inventory and order point quantity which are managed by the inventory management file, The amount of physical inventory determines the lot number which is less than order point quantity as a production instruction lot number, About each of the determined lot number, the difference of the replenishment point quantity and the amount of physical inventory which are managed by the inventory management file is calculated as a maximum producible quantity, Based on the average shipment per day, and the days by the next planning-of-production day, Calculate the amount of shipment prediction by the next planning-of-production day, and from this calculated amount of shipment prediction, and the amount of physical inventory managed by the inventory management file. Calculate the amount of stock forecasts in the next planning-of-production day, and the difference of this calculated amount of stock forecasts and the order point quantity managed by the inventory management file is calculated as a minimum production initial complement, Since it constituted so that the optimal amount of planning of production might be created between this calculated maximum producible quantity and the minimum production initial complement, creation of the amount of planning of production which chooses only the lot number which should be produced at the time of planning of planning of production, and can avoid restrictions of a plan substitute of production is attained.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]It is a block diagram showing the system configuration of the amount preparation

device of planning of production which performs the amount preparation method of planning of production of this invention.

[Drawing 2] It is an explanatory view showing the relation of the amount of physical inventory, order point quantity, replenishment point quantity, a maximum producible quantity, and the minimum production initial complement in image.

[Drawing 3] It is a data configuration figure of an inventory management file.

[Drawing 4] It is the explanatory view in which the example of a calculation result of a maximum producible quantity was summarized in list form.

[Drawing 5] It is an explanatory view showing the daily mean shipment of each lot number for which it asked from the past shipment track record etc.

[Drawing 6] It is the explanatory view in which the example of a calculation result of the amount of planning-of-production period shipment prediction was summarized in list form.

[Drawing 7] It is the explanatory view in which the example of a calculation result of the amount of stock forecasts and the minimum production initial complement was summarized in list form.

[Drawing 8] It is the explanatory view in which the minimum production initial complement of each lot number and a maximum producible quantity were summarized in list form.

[Description of Notations]

- 1 Inventory management department
- 2 Production instruction lot number deciding part
- 3 A maximum producible quantity calculation part
- 4 The minimum production initial-complement calculation part

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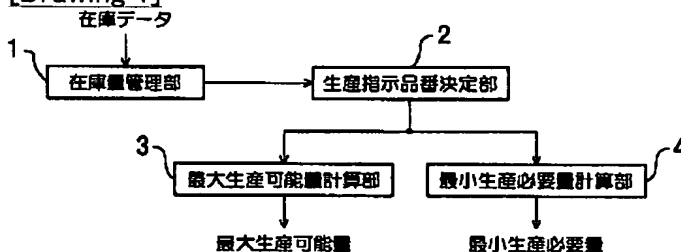
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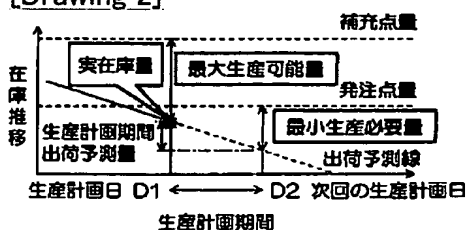
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DRAWINGS

[Drawing 1]



[Drawing 2]



[Drawing 3]

品番	実在庫量	発注点量	補充点量
AA	80	100	200
BB	150	200	400
CC	260	300	600
DD	420	400	800
EE	550	500	1000

[Drawing 4]

品番	最大生産可能量	実在庫量	発注点量	補充点量
AA	120	80	100	200
BB	250	150	200	400
CC	340	260	300	600

[Drawing 5]

品番	日平均出荷量
AA	10
BB	20
CC	30

[Drawing 6]

品番	生産計画期間出荷予測量	日平均出荷量
AA	70	10
BB	140	20
CC	210	30

[Drawing 7]

品番	最小生産必要量	在庫予測量	生産計画期間出荷予測量	実在庫量	発注点量
AA	90	10	70	80	100
BB	190	10	140	150	200
CC	250	50	210	260	300

[Drawing 8]

品番	最小生産必要量	最大生産可能量
AA	90	120
BB	190	250
CC	250	340

[Translation done.]

書誌

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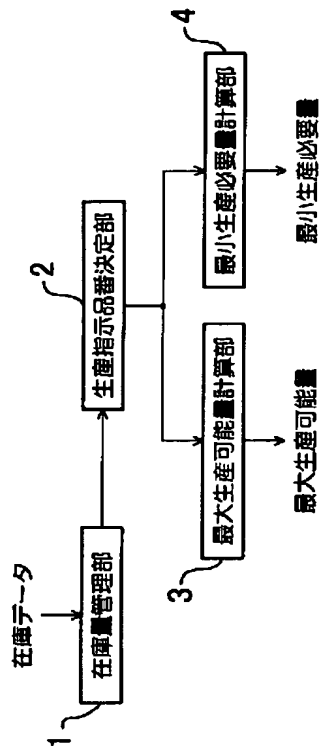
3C042 RJ10

要約

(57)【要約】

【課題】生産計画の立案時に生産すべき品番だけを選択し、かつ生産の段取り替えの制約を回避できるような生産計画量を作成する。

【解決手段】実在庫量、発注点量、及び補充点量を管理する在庫量管理部1と、実在庫量と発注点量とに基づき、実在庫量が発注点量を下回っている品番を生産指示品番として決定する生産指示品番決定部2と、生産指示品番として決定された品番について、補充点量と実在庫量との差分を最大生産可能量として計算する最大生産可能量計算部3と、生産指示品番として決定された品番について、1日当たりの平均出荷量と次の生産計画日までの日数とに基づいて、次の生産計画日までの出荷予測量を計算し、この出荷予測量と実在庫量とから、次の生産計画日における在庫予測量を計算し、この在庫予測量と発注点量との差分を最少生産必要量として計算する最少生産必要量計算部4とを備えている。



請求の範囲

【特許請求の範囲】

【請求項1】品番ごとの実際の在庫量である実在庫量、その品番の基準在庫量である発注点量、及び在庫補充量である補充点量を管理する在庫管理部と、この在庫管理部に管理されている実在庫量と発注点量とに基づき、実在庫量が発注点量を下回っている品番を生産指示品番として決定する生産指示品番決定部と、この生産指示品番決定部により決定された品番のそれぞれについて、前記在庫管理部に管理されている補充点量と実在庫量との差分を最大生産可能量として計算する最大生産可能量計算部と、前記生産指示品番決定部により決定された品番のそれぞれについて、1日当たりの平均出荷量と次の生産計画日までの日数とに基づき、次の生産計画日までの出荷予測量を計算し、この出荷予測量と実在庫量とから、次の生産計画日における在庫予測量を計算し、この在庫予測量と前記在庫管理部に管理されている発注点量との差分を最少生産必要量として計算する最少生産必要量計算部とを備え、前記生産指示品番決定部により決定された品番のそれぞれについて、前記最大生産可能量と前記最少生産必要量との間で最適な生産計画量を作成することを特徴とする生産計画量作成装置。

【請求項2】在庫管理ファイルに管理されている実在庫量と発注点量とに基づき、実在庫量が発注点量を下回っている品番を生産指示品番として決定する手順と、決定された品番のそれぞれについて、在庫管理ファイルに管理されている補充点量と実在庫量との差分を最大生産可能量として計算する手順と、1日当たりの平均出荷量と次の生産計画日までの日数とに基づいて、次の生産計画日までの出荷予測量を計算する手順と、この計算した出荷予測量と在庫管理ファイルに管理されている実在庫量とから、次の生産計画日における在庫予測量を計算する手順と、この計算した在庫予測量と在庫管理ファイルに管理されている発注点量との差分を最少生産必要量として計算する手順と、決定された品番のそれぞれについて、前記最大生産可能量と前記最少生産必要量との間で最適な生産計画量を作成する手順と、を有する生産計画量作成方法。

詳細な説明

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、発注点管理等の在庫管理が必要な見込み生産品の生産計画量を決定する生産計画量作成装置及び生産計画量作成方法に係り、より詳細には、生産の段取り替え(金型交換や樹脂の色交換等)の制約を回避できるように生産計画量(生産指示量)を作成する生産計画量作成装置及び生産計画量作成方法に関する。

【0002】

【従来の技術】従来より、発注点管理方式による生産計画量作成装置が種々提案されている。

【0003】例えば、特開平7-24703号公報に記載の生産計画量作成装置は、在庫量とオーダー量との関係から生産すべき品種を示す選定品種を選定し、かつ選定品種のそれぞれについての生産ロット量を算出する生産品種選定部と、選定品種のそれぞれについて、生産品種選定部により算出された生産ロット量と予め与えられた品種ごとのタクトタイムとから、選定品種のそれぞれについて、生産ロット量の生産に要する生産所要時間を算出する所要時間算出部と、段取り替えを行うことができない時間帯を示す不能時間帯より生産所要時間が長い選定品種をその他の選定品種から区分する品種区分部と、この品種区分部において不能時間帯より生産所要時間が長いとして区分された選定品種の生産を、不能時間帯に割り付けた工程表を作成する工程表作成部とを備えた構成となっている。

【0004】すなわち、生産ロット量の生産所要時間が不能時間帯より長い品種を選定品種とし、この選定品種の生産を不能時間帯に割り付けることにより、不能時間帯内では生産が終了しないように、つまり段取り替えが可能となる時間まで生産を継続するようにしたものである。

【0005】このような従来の生産計画量作成装置においては、発注点管理を行う製品の生産計画量(品番、量)を決定するとき、量については補充点量と実在庫量とから生産計画量を計算している。また、生産の段取り替えの制約を回避するための対策として、実在庫量が発注点を下回っていない品番についても、生産計画の候補品番として指示している。すなわち、生産してもよい品番を増やすことで、段取り替えの制約を回避するようにしていた。

【0006】

【発明が解決しようとする課題】上記した従来の生産計画量作成装置による生産計画量の作成方法では、1つの品種(品番)に対して生産計画量が1種類しかなく、生産の段取り替えの回避のために、本来生産する必要のない品番も生産計画の候補に入れて、その中から、制約を回避できるように生産順を決めている。そのため、生産する必要のない品番が生産されることになり、無駄な在庫が増えたり、生産すべき品番(実在庫量が発注点量より少ない、発注点切れを起こしている品番)の生産順序が後ろに回されてしまうといった不具合が発生していた。

【0007】本発明は係る問題点を解決すべく創案されたもので、その目的は、生産計画の立案時に生産すべき品番だけを選択し、かつ生産の段取り替えの制約を回避できるような生産計画量の作成が可能な生産計画量作成装置及び生産計画量作成方法を提供することにある。

【0008】

【課題を解決するための手段】上記課題を解決するため、本発明の請求項1に記載の生産計画量作成装置は、品番ごとの実際の在庫量である実在庫量、その品番の基準在庫量である発注点量、及び在庫補充量である補充点量を管理する在庫量管理部と、この在庫量管理部に管理されている実在庫量と発注点量とに基づき、実在庫量が発注点を下回っている品番を生産指示品番として決定する生産指示品番決定部と、この生産指示品番決定部により決定された品番のそれぞれについて、前記在庫量管理部に管理されている補充点量と実在庫量との差分を最大生産可能量として計算する最大生産可能量計算部と、前記生産指示品番決定部により決定された品番のそれぞれについて、1日当たりの平均出荷量と次の生産計画日までの日数とに基づいて、次の生産計画日までの出荷予測量を計算し、この出荷予測量と実在庫量とから、次の生産計画日における在庫予測量を計算し、この在庫予測量と前記在庫量管理部に管理されている発注点量との差分を最少生産必要量として計算する最少生産必要量計算部とを備え、前記生産指示品番決定部により決定された品番のそれぞれについて、前記最大生産可能量と前記最少生産必要量との間で最適な生産計画量を作成することを特徴とする。

【0009】また、本発明の請求項2に記載の生産計画量作成方法は、在庫量管理ファイルに管理されている実在庫量と発注点量とに基づき、実在庫量が発注点を下回っている品番を生産指示品番として決定する手順と、決定された品番のそれぞれについて、在庫量管理ファイルに管理されている補充点量と実在庫量との差分を最大生産可能量として計算する手順と、1日当たりの平均出荷量と次の生産計画日までの日数とに基づいて、次の生産計画日までの出荷予測量を計算する手順と、この計算した出荷予測量と在庫量管理ファイルに管理されている実在庫量とから、次の生産計画日における在庫予測量を計算する手順と、この計算した在庫予測量と在庫量管理

ファイルに管理されている発注点量との差分を最少生産必要量として計算する手順と、決定された品番のそれぞれについて、最大生産可能量と最少生産必要量との間で最適な生産計画量を作成する手順とからなることを特徴とする。

【0010】

【発明の実施の形態】以下、本発明の実施の形態について、図面を参照して説明する。

【0011】図1は、本発明の生産計画量作成方法を実行する生産計画量作成装置のシステム構成を示すブロック図である。

【0012】この生産計画量作成装置は、大別すると、在庫量管理部1と、生産指示品番決定部2と、最大生産可能量計算部3と、最小生産必要量計算部4とで構成されている。

【0013】在庫量管理部1は、図示しない在庫管理用コンピュータから得られる在庫データに基づいて、品番ごとの実際の在庫量である実在庫量、その品番の基準在庫量である発注点量、及び在庫補充量である補充点量を管理するブロックであり、図3に示すようなファイル形式で管理されている。

【0014】生産指示品番決定部2は、在庫量管理部1に管理されている実在庫量と発注点量とに基づき、実在庫量が発注点量を下回っている品番を生産指示品番として決定するブロックである。

【0015】最大生産可能量計算部3は、生産指示品番決定部2により決定された品番のそれぞれについて、在庫量管理部1に管理されている補充点量と実在庫量との差分を最大生産可能量として計算するブロックである。

【0016】最小生産必要量計算部4は、生産指示品番決定部2により決定された品番のそれぞれについて、1日当たりの平均出荷量と次の生産計画日までの日数とに基づき、次の生産計画日までの出荷予測量を計算し、この出荷予測量と実在庫量とから、次の生産計画日における在庫予測量を計算し、この在庫予測量と在庫量管理部1に管理されている発注点量との差分を最少生産必要量として計算するブロックである。1日当たりの平均出荷量のデータは、図示しない上位コンピュータにより管理されている過去の出荷実績やオーダ実績から求められるデータである。

【0017】すなわち、本発明の生産計画量作成装置は、生産指示品番決定部2により決定された品番のそれぞれについて、最大生産可能量計算部3で計算された最大生産可能量と、最小生産必要量計算部4で計算された最少生産必要量との間で、最適な生産計画量を作成することになる。

【0018】ここで、実在庫量、発注点量、補充点量、最大生産可能量、最小生産必要量について、図2に示すイメージ図を参照してその関係を説明する。

【0019】図中の発注点量や補充点量は、従来周知の発注点管理方式において用いられるものであって、過去の出荷実績やオーダ実績に基づき、品番ごとに設定される。また、図中の実線が生産計画日D1までの在庫推移であり、生産計画日D1の実在庫量を補充点量から引いた値が、その時点での最大生産可能量となる。また、図中の破線が生産計画日D1以降の出荷予測推移であり、これは過去の出荷実績やオーダ実績などに基づいて予測された値である。そして、この出荷予測推移に基づき、次の生産計画日D2における在庫予測量を発注点量から引いた値が、最小生産必要量となっている。

【0020】次に、上記構成の生産計画量作成装置における生産計画量の作成処理について、具体的に説明する。

【0021】在庫量管理部1で管理されている各品番の実在庫量、発注点量、及び補充点量が、例えば図3に示すようになっていくとする。つまり、品番AAについては、実在庫量:80、発注点量:100、補充点量:200となっている。ここでは、AA、BB、CC、DD、EEの5種類の品番が例示されている。

【0022】生産指示品番決定部2では、在庫量管理部1に管理されている5種類の品番AA～EEのそれぞれについて、実在庫量と発注点量とに基づき、実在庫量が発注点量を下回っている品番を生産指示品番として決定する。この例では、品番AA、BB、CCの3種類について、実在庫量が発注点量を下回っているため、この3種類の品番AA、BB、CCが生産指示品番として決定される。

【0023】最大生産可能量計算部3では、生産指示品番決定部2により決定された3種類の品番AA、BB、CCのそれぞれについて、在庫量管理部1に管理されている補充点量と実在庫量との差分を計算し、その値を最大生産可能量とする(下式(1)参照)。

【0024】

最大生産可能量＝補充点量－実在庫量・・・(1)

すなわち、品番AAについては、 $200 - 80 = 120$ 、品番BBについては、 $400 - 150 = 250$ 、品番CCについては、 $600 - 260 = 340$ 、となる。この計算結果例を図4に一覧形式で示している。

【0025】最小生産必要量計算部4では、生産指示品番決定部2により決定された3種類の品番A、BB、CCのそれぞれについて、まず、1日当たりの平均出荷量と次の生産計画日までの日数とに基づき、次の生産計画日までの出荷予測量(生産計画期間出荷予測量)を計算する。ここで、1日当たりの平均出荷量(日平均出荷量)は、過去の出荷実績などから求められる。図5は、過去の出荷実績などから求めた各品番AA、BB、CCの日平均出荷量を例示している。また、本例では、週1回、生産計画を作成するものとする、生産計画期間(図2のD1からD2までの期間)は7日となる。よって、各品番AA、BB、CCの生産計画期間出荷予測量は、下式(2)によって計算される。

【0026】

生産計画期間出荷予測量 = 日平均出荷量 × 生産計画期間 … (2)

すなわち、品番AAについては、 $10 \times 7 = 70$ 、品番BBについては、 $20 \times 7 = 140$ 、品番CCについては、 $30 \times 7 = 210$ 、となる。この計算結果例を図6に一覧形式で示している。

【0027】次に、この生産計画期間出荷予測量と実在庫量とから、次の生産計画日における在庫予測量を、下式(3)によって計算する。

【0028】

在庫予測量 = 実在庫量 - 生産計画期間出荷予測量 … (3)

すなわち、品番AAについては、 $80 - 70 = 10$ 、品番BBについては、 $150 - 140 = 10$ 、品番CCについては、 $260 - 210 = 50$ 、となる。

【0029】そして、この(3)式で計算された各品番AA、BB、CCの在庫予測量が、発注点を切らないように、最小生産必要量を下式(4)によって計算する。

【0030】

最小生産必要量 = 発注点量 - 在庫予測量 … (4)

すなわち、品番AAについては、 $100 - 10 = 90$ 、品番BBについては、 $200 - 10 = 190$ 、品番CCについては、 $300 - 50 = 250$ 、となる。この計算結果例を図7に一覧形式で示している。

【0031】以上の計算処理により、各品番AA、BB、CCについての最小生産必要量と最大生産可能量は、図8に示すように計算される。この結果から、例えば品番AAについては、最小生産必要量(90)～最大生産可能量(120)の間で、任意に生産計画量を決定できるので、生産の段取り替えの制約にも柔軟に対応できる。また、生産計画量を任意に決定しても、最小生産必要量以上を生産することになるので、次の生産計画のタイミングで、発注点切れを起こすことはない。

【0032】

【発明の効果】本発明の生産計画量作成装置及び生産計画量作成方法は、在庫量管理ファイルに管理されている実在庫量と発注点量とに基づき、実在庫量が発注点を下回っている品番を生産指示品番として決定し、決定した品番のそれぞれについて、在庫量管理ファイルに管理されている補充点量と実在庫量との差分を最大生産可能量として計算し、1日当たりの平均出荷量と次の生産計画日までの日数とに基づいて、次の生産計画日までの出荷予測量を計算し、この計算した出荷予測量と在庫量管理ファイルに管理されている実在庫量とから、次の生産計画日における在庫予測量を計算し、この計算した在庫予測量と在庫量管理ファイルに管理されている発注点量との差分を最少生産必要量として計算し、この計算した最大生産可能量と最少生産必要量との間で最適な生産計画量を作成するように構成したので、生産計画の立案時に生産すべき品番だけを選択し、かつ生産の段取り替えの制約を回避できるような生産計画量の作成が可能となる。

図の説明

【図面の簡単な説明】

【図1】本発明の生産計画量作成方法を実行する生産計画量作成装置のシステム構成を示すブロック図である。

【図2】実在庫量、発注点量、補充点量、最大生産可能量、及び最小生産必要量の関係をイメージ的に示した説明図である。

【図3】在庫量管理ファイルのデータ構成図である。

【図4】最大生産可能量の計算結果例を一覧形式でまとめた説明図である。

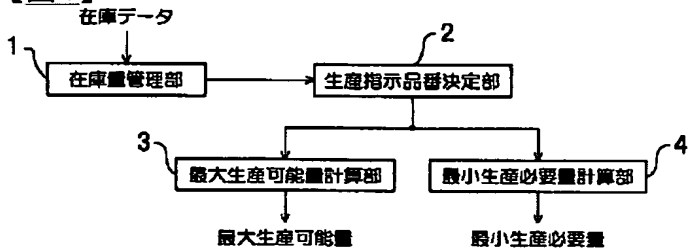
【図5】過去の出荷実績などから求めた各品番の日平均出荷量を示す説明図である。

【図6】生産計画期間出荷予測量の計算結果例を一覧形式でまとめた説明図である。
 【図7】在庫予測量と最小生産必要量の計算結果例を一覧形式でまとめた説明図である。
 【図8】各品番の最小生産必要量と最大生産可能量とを一覧形式でまとめた説明図である。
 【符号の説明】

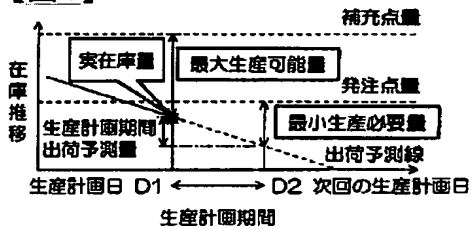
- 1 在庫量管理部
- 2 生産指示品番決定部
- 3 最大生産可能量計算部
- 4 最小生産必要量計算部

図面

【図1】



【図2】



【図3】

品番	実在庫量	発注点量	補充点量
AA	80	100	200
BB	150	200	400
CC	260	300	600
DD	420	400	800
EE	550	500	1000

【図4】

品番	最大生産可能量
AA	120
BB	250
CC	340

実在庫量	発注点量	補充点量
80	100	200
150	200	400
260	300	600

【図5】

品番	日平均出荷量
AA	10
BB	20
CC	30

【図6】

品番	生産計画期間出荷予測量
AA	70
BB	140
CC	210

日平均出荷量
10
20
30

【図7】

品番	最小生産必要量		在庫予測量		生産計画期間出荷予測量	実在庫量	発注点量
AA	90	←	10	←	70	80	100
BB	190		10		140	150	200
CC	250		50		210	260	300

【図8】

品番	最小生産必要量	最大生産可能量
AA	90	120
BB	190	250
CC	250	340